

and being re-established, the muscle relaxes (just as it does in the case where paralysis is caused by division of the nerve), and tremor, convulsion and spasm are at an end. Nor is there any doubt that the nerves are paralysed when the circulation fails to the point which is here supposed. Thus, if the circulation in the hand be depressed by immersion in cold water, the sense of touch and the power of movement are partially or wholly destroyed; or if the principal vessel of a limb be tied, the nerves are similarly paralysed until the collateral circulation be established; and in each case, also, the power of provoking "reflex movements" is diminished or destroyed. In either case the nerves are more or less paralysed for want of blood, and, if so, it surely follows that the nerves must be paralysed, and still more effectually, when the circulation fails as it fails in syncope, asphyxia, or death, and when the movement of the blood is almost or altogether at an end. Hence it is quite intelligible that tremor, convulsion or spasm should be caused by want of blood, as is stated in the argument, and that they should cease in syncope, asphyxia, and death; and thus this objection falls to the ground, and with it all objections of the same kind.

Such is an imperfect sketch of the evidence upon which the physical theory of muscular contraction is founded.

II. "On the Structure of some Limestone Nodules enclosed in Seams of Bituminous Coal, with a Description of some Trigonocarpons contained in them." By J. D. HOOKER, M.D., F.R.S., and E. BINNEY, Esq. Received November 23, 1854.

The authors first describe the occurrence of the limestone nodules, which form a continuous bed in the centre of a thin seam of bituminous coal in the lower part of the Lancashire coal-field. The nodules were of various sizes, some weighing many pounds, and caused the coal to bulge out both above and below them, and they were found to be entirely composed of vegetable tissues converted into carbonate of lime and magnesia. Their formation is supposed by the authors to be due to infiltration of water through the superin-

cumbent shales, which were full of fossil shells supposed to be of marine origin, and the aggregation of the mineral matter round centres of vegetable remains. The chemical constituents of the nodules were found to be carbonates of lime and magnesia, sesquioxide and sulphate of iron, with a little carbonaceous matter.

The probability of these nodules representing an average sample of the vegetable constituents of the surrounding coal is then discussed, and attention is drawn to the very great interest and importance that would attach to them were such a view substantiated, as showing the exact nature of the association of plants which is capable of conversion into bituminous coal.

All the plants contained in the nodules were common in other parts of the coal formation, viz. *Calamodendron*, *Halonias*, *Sigillaria*, *Lepidodendron*, *Stigmarias*, *Trigonocarpon*, *Anabothras*, and others; of these the first-named genus occurred in the greatest abundance and as large fragments of fossil wood. Very many of the specimens were sliced, and being reduced to very thin transparent sections, were examined with the view of determining the botanical character of their contents, and the intimate structure of the masses of more or less homogeneous aspect to which they were reduced by decomposition, previous to or during the operation of calcification. The results were very satisfactory, and seemed to indicate that all traces of vegetable structure may be completely obliterated in the substance of highly bituminized coal, which may nevertheless also contain fragments of wood with their tissues preserved.

An account is then given of the examination of the details of structure of *Trigonocarpon*, and this, as well as the comparison of *Trigonocarpon* with the modern genus *Salisburia*, is illustrated by drawings and analyses.

The authors are still engaged with the study of these nodules, with the view of showing the relationship between *Calamodendron*, *Calamites*, *Sigillaria* and *Anabothra*, and the details are preparing for publication.